OPERATING POLICY 4

FIRE HYDRANTS AND FIRE FLOW

Kirkland Fire/Building Department • 123 Fifth Avenue, Kirkland, WA 98033 • (425) 587-3650

In accordance with the *International Fire Code*, Section 508 Fire Protection Water Supplies, and Appendix B Fire Flow Requirements for Buildings as adopted by the City of Kirkland (Chapter 21.20.060, Kirkland Municipal Code), the Kirkland Fire Department requires that all hydrants installed within Kirkland City limits shall be installed in accordance with the following policy.

GENERAL

1. Fire hydrants shall be installed to meet sound engineering practices and shall meet current A.W.A.A. Standards. An auxiliary gate valve shall be installed between the service main and the hydrant, sufficient to permit the repair or replacement of the hydrant without disruption of water service. The location of all valves, piping, and hydrants shall be properly and accurately indicated on identifiable plans or drawings, a copy of which shall be submitted to, and approved by, the City of Kirkland.

2. Hydrants shall have two male, 2-1/2" hose outlets with National Standard threads, and one male pumper port outlet. The pumper port outlet shall be 4-7/8" outside diameter, measured from crest to crest on threads, and shall have six threads per inch. In addition, a five-inch Stortz quarter turn adapter shall be installed on the pumper port outlet.

3. All hydrants and their supply systems shall be operational and available for use prior to combustible construction.

4. Hydrants located on private property shall be considered a part of that property's fire protection system; the property owner shall maintain these hydrants in an operative condition at all times and shall replace or repair where defective.

5. All hydrants shall be subject to inspection by the Fire Department.

6. There shall be no less than 36 inches of horizontal clearance on all sides of the hydrant. All fire hydrants are to be free of obstacles in order that the fire hydrant may be seen by approaching fire trucks for at least 200 feet. Posts, fences, vehicles, growth, trash, storage and other materials or items shall not be placed or kept near fire hydrants in a manner that would prevent the hydrants from being immediately discernable. The fire department shall not be deterred or hindered from gaining immediate access to the hydrants.

7. Where necessary, hydrants shall be protected from damage by vehicles. The installation of approved posts shall be considered as compliance with this section.

8. All hydrants shall be painted a color which has been approved by the Fire Department and the appropriate Water District so as to be visible under adverse light and weather

conditions. Colors that have been applied by the Water Purveyor or Fire Department are not to be changed except by permission of these departments.

9. Hydrant locations shall be identified by the installation of blue reflective markers. Hydrant locations and removals shall be approved by the Fire Marshal and be coordinated with the Water Purveyor.

10. Buildings or areas requiring fire protection, where fire department vehicle access is difficult or unfeasible, may require a sprinkler system in addition to hydrant installation. (Examples: grades in excess of 15 percent; portions of buildings not accessible to fire apparatus).

11. All fire hydrants should have at least fifteen inches of clearance between the ground and the bottom of the lowest port. This must be figured at finished grade level. The breakaway flange must at all time be above the finished grade level.

RESIDENTIAL (Single-family)

1. The minimum fire flow for one and two family dwelling units is 1,000 GPM and is required over and above the computed domestic usage (i.e, the de-rated fire flow). Fire flow is measured at 20 PSI residual pressure for a duration of two hours. For those areas where the minimum fire flow is not available, fire sprinklers may be substituted. (See Operating Policy 2.)

2. Fire hydrants in residential areas shall be spaced 600 feet or less apart with no hydrant further than 300 feet from the nearest setback on a building lot. The setback requirement shall be as determined by the Kirkland Planning Department in accordance with the Kirkland Zoning Code. All measurements shall be made by vehicular travel distance.

   Exception: For one and two family dwelling units equipped with automatic sprinkler systems, the distance to the nearest setback may be increased to 600 feet.

3. Hydrants installed in new single-family residential areas shall be supplied by not less than 6 inch circulating mains. These systems shall be appropriately engineered, and pipe sizes shall be increased where necessary to provide the necessary flow.

4. Public buildings, including schools, located in single-family residential areas shall be classified as commercial for fire protection purposes and hydrant spacing.

COMMERCIAL

1. All buildings other than one- and two-family dwelling units shall be considered as commercial buildings with fire flow requirements and hydrant spacing determined on criteria set forth within this policy. Fire flow requirements for townhomes or zero lot line homes shall be based on the total square footage.

2. Fire hydrants in commercial areas shall be spaced 300 feet or less apart with no hydrant further than 150 feet from any portion of the building accessible by Fire Department vehicles. This may require on-site hydrants as specified by the Fire Chief. Hydrants should not be located closer than 50 feet to any building when possible and should be no further than 50 feet from the fire department connection for the sprinkler system or standpipes when possible.

3. All fire hydrants are to be accessible to Fire Department vehicles on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building in accordance with Operating Policy 6.

4. For the purpose of this operating policy, the fire flow requirements shall be applied by the Fire Official based upon the *International Fire Code* Appendix B (Fire-Flow Requirements for Buildings), Table B105.1 (see attached)

5. It shall be the responsibility of the developer or property owner to provide a system to supply the required fire flow and sprinkler system water requirements commensurate with the type of occupancy hazard involved. In no case shall the fire flow requirements for commercial areas be less than 1,500 GPM @ 20 PSI residual pressure for a duration of two hours. This basic rate of 1,500 GPM is required over and above the computed daily usage for the area (i.e. the de-rated fire flow). A building may be divided to lower fire flow requirements. Acceptable divisions are as noted in Section B104 (Fire Flow Calculation Area) of the referenced appendix. These divisions do not relieve any sprinkler requirements or the minimum 1,500 GPM that is required for all buildings except one- and two- family dwellings.

The Fire Marshal shall determine the location of the hydrants and the direction they shall face, depending on utility, topography, access, and building location. The Fire Marshal may grant a variance from these requirements providing an equal amount of fire protection can be maintained.

Policy Approved 5/24/11 by
Grace A. Steuart, Fire Marshal
Kirkland Fire Department

TABLE B105.1
MINIMUM REQUIRED FIRE FLOW AND FLOW DURATION FOR BUILDINGS[a]

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute)[c]	FLOW DURATION (hours)
Type IA and IB[b]	Type IIA and IIIA[b]	Type IV and V-A[b]	Type IIB and IIIB[b]	Type V-B[b]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

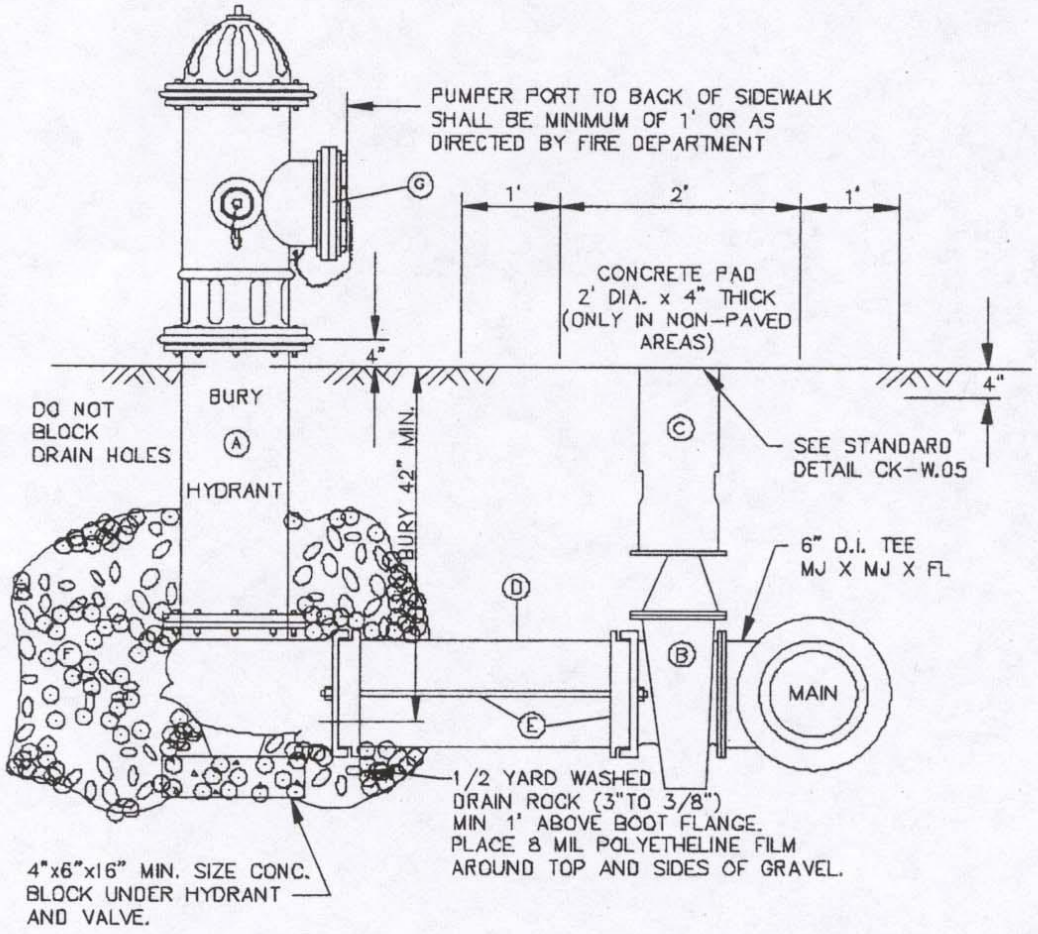
For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. The minimum required fire flow shall be permitted to be reduced by 25 percent for Use Group R.

b. Types of construction are based on the *International Building Code*.

c. Measured at 20 psi.

LAST REVISED: 11/30/99



A. 1-5 1/4" M.V.O. HYDRANT WITH 2-2 1/2" N.S.T. AND 1-4" PUMPER, SEATTLE STANDARD THREAD-M.J. INLET, WITH LUGS, BRASS TO BRASS SUB-SEAT

B. 1-AUXILIARY GATE VALVE: 6" AWWA C509, RESILIENT SEAT, "O" RING STEM SEAL, M.J.xFL. WITH LUGS.

C. 1-TWO-PIECE CAST IRON VALVE BOX EQUAL TO RICH SEATTLE TYPE #045 WITH RECESSED HANDLE LID.

D. 1-6" DUCTILE IRON CLASS 52 CEMENT-LINED PIPE, LENGTH TO FIT. WHERE MORE THAN ONE LENGTH OF PIPE IS REQUIRED, CONNECT PIPES WITH MECHANICAL JOINT SLEEVE.

E. 2 - 3/4" GALVANIZED STEEL SHACKLE RODS, TAR SEALED AFTER ASSEMBLY.

F 1/4 CY - 1:3:6: CONCRETE MIX, POUR IN PLACE TO BLOCK. MAINTAIN CLEARANCE FOR BOLTS.

G. 5" X 4" FEMALE SEATTLE STANDARD THREAD RIGID 5" STORZ ADAPTOR WITH ALL CAPS AND CHAINS OR CABLES. ADAPTOR MATERIAL TO BE ANODIZED ALUMINUM

NOTES:

1. FIRE HYDRANT EXTENSION, IF REQUIRED.
2. FIRE HYDRANT TO BE PAINTED WITH TWO COATS OF HIGH GLOSS OSHA SAFETY YELLOW ENAMEL PAINT.

CITY OF KIRKLAND

PLAN NO. CK-W.14

CITY OF KIRKLAND WASHINGTON

FIRE HYDRANT ASSEMBLY